

CLAIMS:

1. A camera arrangement (200), said arrangement integrally comprising at least two lenses (202, 203, 204) and a photo sensor array (201) in a fixed configuration forming one unit, wherein a first lens (202, 300) of said lenses has an adjustable focal length and comprises:
 - 5 - a first liquid crystal cell comprising a first alignment surface (307) and a second alignment surface (309), at least one of said alignment surfaces (307, 309) being a lens-shaped surface (309) defined by a polymer body (304), said liquid crystal cell further comprising a layer of liquid crystal molecules (305) that have an anisotropic index of refraction and that are arranged between said alignment surfaces (307, 309) such that a
10 predefined molecule orientation is induced; and
 - a pair of electrodes (306, 308) provided on opposite sides of the layer of liquid crystal molecules (305) and operative to control an index of refraction in the layer of liquid crystal molecules (305) by means of an electric field applied therein;
wherein said lenses (202, 203, 204) are arranged in said fixed configuration
15 such that the camera arrangement has an adjustable depth of focus.
2. A camera arrangement (200) according to claim 1, wherein said first lens (202, 300) is operative for light of a predefined polarization that depends on the orientation of the liquid crystal molecules, and wherein said camera arrangement further comprises a polarizer
20 (310) that is transparent for light of said predefined polarization only.
3. A camera arrangement (200) according to claim 1, wherein said first lens further comprises a second liquid crystal cell (402) having a molecule orientation that is essentially perpendicular to the molecule orientation in the first liquid crystal cell (401), such
25 that the two liquid crystal cells (401, 402) are operative for light of opposite polarization, whereby the first lens is adjustable for randomly polarized light.

4. A camera arrangement (200) according to claim 1, wherein a second lens has an adjustable focal length and wherein said first and second lenses are arranged such that the camera arrangement has an adjustable depth of field.
5. A circuit board carrying a camera arrangement according to claim 1 together with additional electronic components.
6. A mobile phone comprising a camera arrangement according to claim 1.
- 10 7. A method of manufacturing a camera arrangement (200), said method including the steps of:
- forming a first lens (202) that has an adjustable focal length and that comprises liquid crystal molecules, said forming involving the steps of:
 - arranging a monomer (603) between a first substrate (602) and a mould
 - 15 (601), such that a lens-shaped monomer body is formed on said first substrate;
 - polymerizing said monomer (604), thereby forming a lens-shaped polymer body on said first substrate;
 - removing said mould from said polymer body;
 - arranging an alignment layer on said polymer body;
 - 20 - providing a second substrate having an alignment layer;
 - arranging electrodes on said first and said second substrates;
 - sandwiching a layer of liquid crystal molecules (608) between said polymer body and said second substrate, thereby forming a lens having an adjustable focal length;
- said method further involving the steps of:
- 25 - providing a second lens (203, 204);
 - providing a photo sensor array (201); and
 - arranging said first lens (201), second lens (203, 204), and photo sensor array (201) in a fixed configuration forming one unit such that an adjustable depth of focus is provided for in the camera arrangement.
- 30 8. A method according to claim 7, wherein a sensor surface of said photo sensor array (201) is exploited as one of said first substrate and said second substrate.

9. A method according to claim 7, wherein the step of polymerizing involves exposing the monomer to electromagnetic radiation (604).
10. A method according to claim 9, wherein said electromagnetic radiation is
5 ultraviolet light (604).
11. A method according to claim 7, wherein said step of polymerizing involves heating the monomer above 30°C and preferably above 120°C.
- 10 12. A method according to claim 7, wherein capillary forces are exploited while sandwiching a layer of liquid crystal molecules.
13. A method according to claim 7, wherein spacer elements (607) are arranged between said first substrate and said second substrate.
- 15 14. A method according to claim 13, wherein said spacer elements (607) are formed out of a polymer, as an integral part of said polymer body.
- 15 15. A method according to claim 7, wherein transparent electrodes (306, 308) are
20 provided directly on the respective substrates.
16. A method according to claim 7, wherein the alignment layers (307, 309) on said polymer body and said second substrate have essentially parallel but opposite alignment directions.
- 25 17. A method according to claim 7, wherein the electrode (308) that is arranged on said first substrate is arranged on said lens-shaped polymer body.